



$$\Lambda_b^0 \text{ Status: } ***$$

In the quark model, a Λ_b^0 is an isospin-0 $ud\bar{b}$ state. The lowest Λ_b^0 ought to have $J^P = 1/2^+$. None of I , J , or P have actually been measured.

NODE=S040

NODE=S040

NODE=S040205

NODE=S040M

NODE=S040M

NEW

Λ_b^0 MASS

$m_{\Lambda_b^0}$

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
5619.4 ± 0.6 OUR AVERAGE				
[5619.4 ± 0.7 MeV OUR 2012 AVERAGE]				
5619.7 ± 0.7 ± 1.1	1 AAD	13U ATLS	$p\bar{p}$ at 7 TeV	
5619.19 ± 0.70 ± 0.30	1 AAIJ	12E LHCb	$p\bar{p}$ at 7 TeV	
5619.7 ± 1.2 ± 1.2	2 ACOSTA	06 CDF	$p\bar{p}$ at 1.96 TeV	
5621 ± 4 ± 3	3 ABE	97B CDF	$p\bar{p}$ at 1.8 TeV	
5668 ± 16 ± 8	4 ABREU	96N DLPH	$e^+e^- \rightarrow Z$	
5614 ± 21 ± 4	4 BUSKULIC	96L ALEP	$e^+e^- \rightarrow Z$	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen	5 ABE	93B CDF	Sup. by ABE 97B	
5640 ± 50 ± 30	16	6 ALBAJAR	91E UA1	$p\bar{p}$ 630 GeV
5640 +100 -210	52	BARI	91 SFM	$\Lambda_b^0 \rightarrow p D^0 \pi^-$
5650 +150 -200	90	BARI	91 SFM	$\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^+ \pi^- \pi^-$

1 Uses $\Lambda_b^0 \rightarrow J/\psi \Lambda$ fully reconstructed decays.

2 Uses exclusively reconstructed final states containing a $J/\psi \rightarrow \mu^+ \mu^-$ decays.

3 ABE 97B observed 38 events with a background of 18 ± 1.6 events in the mass range $5.60\text{--}5.65 \text{ GeV}/c^2$, a significance of > 3.4 standard deviations.

4 Uses 4 fully reconstructed Λ_b events.

5 ABE 93B states that, based on the signal claimed by ALBAJAR 91E, CDF should have found $30 \pm 23 \Lambda_b^0 \rightarrow J/\psi(1S)\Lambda$ events. Instead, CDF found not more than 2 events.

6 ALBAJAR 91E claims 16 ± 5 events above a background of 9 ± 1 events, a significance of about 5 standard deviations.

OCCUR=2

NODE=S040M;LINKAGE=AA

NODE=S040M;LINKAGE=AT

NODE=S040M;LINKAGE=F

NODE=S040M;LINKAGE=E

NODE=S040M;LINKAGE=D

NODE=S040M;LINKAGE=C

NODE=S040DM
NODE=S040DM

NODE=S040DM;LINKAGE=AT

NODE=S040DM2
NODE=S040DM2

NODE=S040DM2;LINKAGE=AA

NODE=S040T

NODE=S040T

Λ_b^0 MEAN LIFE

See b -baryon Admixture section for data on b -baryon mean life average over species of b -baryon particles.

"OUR EVALUATION" is an average using rescaled values of the data listed below. The average and rescaling were performed by the Heavy Flavor Averaging Group (HFAG) and are described at <http://www.slac.stanford.edu/xorg/hfag/>. The averaging/rescaling procedure takes into account correlations between the measurements and asymmetric lifetime errors.

NODE=S040T

NEW;→ UNCHECKED ←

VALUE (10^{-12} s)	EVTS	DOCUMENT ID	TECN	COMMENT
1.429 ± 0.024 OUR EVALUATION				
[(1.425 ± 0.032) $\times 10^{-12} \text{ s}$ OUR 2012 EVALUATION]				
1.449 ± 0.036 ± 0.017	9 AAD	13U ATLS	$p\bar{p}$ at 7 TeV	

|

$1.303 \pm 0.075 \pm 0.035$	⁹ ABAZOV	12U D0	$p\bar{p}$ at 1.96 TeV	
$1.537 \pm 0.045 \pm 0.014$	⁹ AALTONEN	11 CDF	$p\bar{p}$ at 1.96 TeV	
$1.401 \pm 0.046 \pm 0.035$	¹⁰ AALTONEN	10B CDF	$p\bar{p}$ at 1.96 TeV	
$1.290^{+0.119}_{-0.110}{}^{+0.087}_{-0.091}$	¹¹ ABAZOV	07U D0	$p\bar{p}$ at 1.96 TeV	
$1.11^{+0.19}_{-0.18} \pm 0.05$	¹² ABREU	99W DLPH	$e^+e^- \rightarrow Z$	
$1.29^{+0.24}_{-0.22} \pm 0.06$	¹² ACKERSTAFF	98G OPAL	$e^+e^- \rightarrow Z$	
1.21 ± 0.11	¹² BARATE	98D ALEP	$e^+e^- \rightarrow Z$	
$1.32 \pm 0.15 \pm 0.07$	¹³ ABE	96M CDF	$p\bar{p}$ at 1.8 TeV	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$1.218^{+0.130}_{-0.115} \pm 0.042$	⁹ ABAZOV	07S D0	Repl. by ABAZOV 12U	
$1.593^{+0.083}_{-0.078} \pm 0.033$	⁹ ABULENCIA	07A CDF	Repl. by AALTONEN 11	
$1.22^{+0.22}_{-0.18} \pm 0.04$	⁹ ABAZOV	05C D0	Repl. by ABAZOV 07S	
$1.19^{+0.21}_{-0.18} {}^{+0.07}_{-0.08}$	ABREU	96D DLPH	Repl. by ABREU 99W	OCCUR=3
$1.14^{+0.22}_{-0.19} \pm 0.07$	69 AKERS	95K OPAL	Repl. by ACKERSTAFF 98G	
$1.02^{+0.23}_{-0.18} \pm 0.06$	44 BUSKULIC	95L ALEP	Repl. by BARATE 98D	OCCUR=2

9 Measured mean life using fully reconstructed $\Lambda_b^0 \rightarrow J/\psi \Lambda$ decays.

10 Measured mean life using fully reconstructed $\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^-$ decays.

11 Measured using semileptonic decays $\Lambda_b^0 \rightarrow \Lambda_c^+ \mu\nu X$ and $\Lambda_c^+ \rightarrow K_S^0 p$.

12 Measured using $\Lambda_c \ell^-$ and $\Lambda \ell^+ \ell^-$.

13 Excess $\Lambda_c \ell^-$, decay lengths.

$\tau_{\Lambda_b^0}/\tau_{B^0}$ MEAN LIFE RATIO

$\tau_{\Lambda_b^0}/\tau_{B^0}$ (direct measurements)

VALUE	DOCUMENT ID	TECN	COMMENT	
0.975 ± 0.034 OUR AVERAGE	Error includes scale factor of 1.7. See the ideogram below. [1.00 ± 0.06 OUR 2012 AVERAGE Scale factor = 2.0]			
$0.960 \pm 0.025 \pm 0.016$	¹⁴ AAD	13U ATLS	$p\bar{p}$ at 7 TeV	
$0.864 \pm 0.052 \pm 0.033$	^{15,16} ABAZOV	12U D0	$p\bar{p}$ at 1.96 TeV	
$1.020 \pm 0.030 \pm 0.008$	¹⁵ AALTONEN	11 CDF	$p\bar{p}$ at 1.96 TeV	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.811^{+0.096}_{-0.087} \pm 0.034$	^{15,16} ABAZOV	07S D0	Repl. by ABAZOV 12U	
1.041 ± 0.057	¹⁷ ABULENCIA	07A CDF	Repl. by AALTONEN 11	
$0.87^{+0.17}_{-0.14} \pm 0.03$	¹⁷ ABAZOV	05C D0	Repl. by ABAZOV 07S	

14 Measured with $\Lambda_b^0 \rightarrow J/\psi(\mu^+\mu^-) \Lambda^0(p\pi^-)$ decays.

15 Uses fully reconstructed $\Lambda_b \rightarrow J/\psi \Lambda$ decays.

16 Uses $B^0 \rightarrow J/\psi K_S^0$ decays for denominator.

17 Measured mean life ratio using fully reconstructed decays.

NODE=S040211

NODE=S040TR

NODE=S040TR

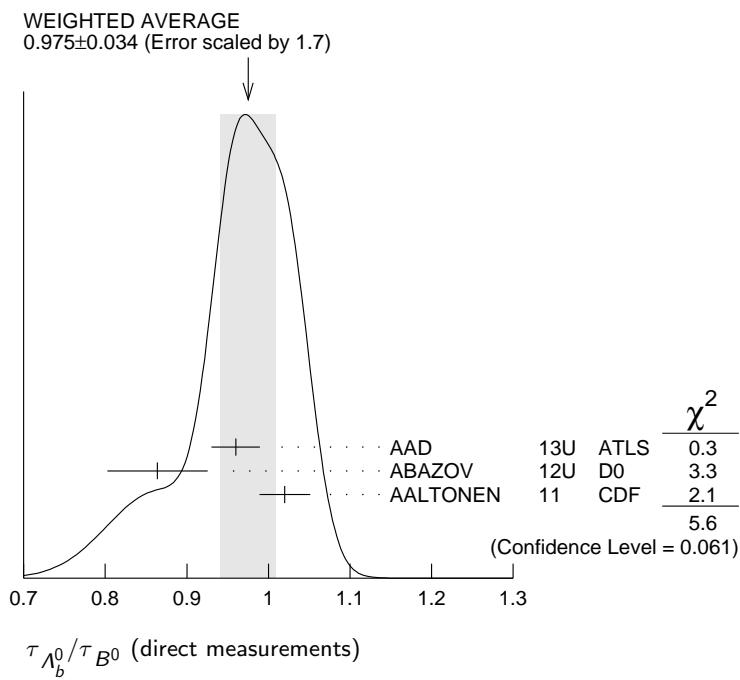
NEW

NODE=S040TR;LINKAGE=AD

NODE=S040TR;LINKAGE=ZO

NODE=S040TR;LINKAGE=ZV

NODE=S040TR;LINKAGE=AB



Λ_b^0 DECAY MODES

NODE=S040210;NODE=S040

NODE=S040

The branching fractions $B(b\text{-baryon} \rightarrow \Lambda \ell^- \bar{\nu}_\ell \text{anything})$ and $B(\Lambda_b^0 \rightarrow \Lambda_c^+ \ell^- \bar{\nu}_\ell \text{anything})$ are not pure measurements because the underlying measured products of these with $B(b \rightarrow b\text{-baryon})$ were used to determine $B(b \rightarrow b\text{-baryon})$, as described in the note "Production and Decay of b -Flavored Hadrons."

For inclusive branching fractions, e.g., $\Lambda_b \rightarrow \bar{\Lambda}_c$ anything, the values usually are multiplicities, not branching fractions. They can be greater than one.

Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
$\Gamma_1 J/\psi(1S) \Lambda \times B(b \rightarrow \Lambda_b^0)$	$(5.8 \pm 0.8) \times 10^{-5}$	DESIG=3
$\Gamma_2 p D^0 \pi^-$		DESIG=1
$\Gamma_3 \Lambda_c^+ \pi^-$	$(5.7^{+4.0}_{-2.6}) \times 10^{-3}$	S=1.6
$\Gamma_4 \Lambda_c^+ a_1(1260)^-$	seen	DESIG=12
$\Gamma_5 \Lambda_c^+ \pi^+ \pi^- \pi^-$	$(8^{+5}_{-4}) \times 10^{-3}$	S=1.6
$\Gamma_6 \Lambda_c(2595)^+ \pi^-, \Lambda_c(2595)^+ \rightarrow \Lambda_c^+ \pi^+ \pi^-$	$(3.7^{+2.8}_{-2.3}) \times 10^{-4}$	DESIG=22
$\Gamma_7 \Lambda_c(2625)^+ \pi^-, \Lambda_c(2625)^+ \rightarrow \Lambda_c^+ \pi^+ \pi^-$	$(3.6^{+2.7}_{-2.1}) \times 10^{-4}$	DESIG=23
$\Gamma_8 \Sigma_c(2455)^0 \pi^+ \pi^-, \Sigma_c^0 \rightarrow \Lambda_c^+ \pi^-$	$(6^{+5}_{-4}) \times 10^{-4}$	DESIG=24
$\Gamma_9 \Sigma_c(2455)^{++} \pi^- \pi^-, \Sigma_c^{++} \rightarrow \Lambda_c^+ \pi^+$	$(3.5^{+2.8}_{-2.3}) \times 10^{-4}$	DESIG=25
$\Gamma_{10} \Lambda K^0 2\pi^+ 2\pi^-$		DESIG=2
$\Gamma_{11} \Lambda_c^+ \ell^- \bar{\nu}_\ell \text{anything}$	[a] $(9.8 \pm 2.2) \%$	DESIG=6
$\Gamma_{12} \Lambda_c^+ \ell^- \bar{\nu}_\ell$	$(6.5^{+3.2}_{-2.5}) \%$	S=1.8
$\Gamma_{13} \Lambda_c^+ \pi^+ \pi^- \ell^- \bar{\nu}_\ell$	$(5.6 \pm 3.1) \%$	DESIG=16
$\Gamma_{14} \Lambda_c(2595)^+ \ell^- \bar{\nu}_\ell$	$(8 \pm 5) \times 10^{-3}$	DESIG=18
$\Gamma_{15} \Lambda_c(2625)^+ \ell^- \bar{\nu}_\ell$	$(1.4^{+0.9}_{-0.7}) \%$	DESIG=19

Γ_{16}	$\Sigma_c(2455)^0 \pi^+ \ell^- \bar{\nu}_\ell$				DESIG=20
Γ_{17}	$\Sigma_c(2455)^{++} \pi^- \ell^- \bar{\nu}_\ell$				DESIG=21
Γ_{18}	$p h^-$	[b] < 2.3	$\times 10^{-5}$	CL=90%	DESIG=17
Γ_{19}	$p \pi^-$	(4.0 ± 0.8)	$\times 10^{-6}$		DESIG=9
Γ_{20}	$p K^-$	(4.8 ± 0.9)	$\times 10^{-6}$		DESIG=10
Γ_{21}	$\Lambda \mu^+ \mu^-$	(1.7 ± 0.7)	$\times 10^{-6}$		DESIG=26
Γ_{22}	$\Lambda \gamma$	< 1.3	$\times 10^{-3}$	CL=90%	DESIG=13

[a] Not a pure measurement. See note at head of Λ_b^0 Decay Modes.

[b] Here h^- means π^- or K^- .

LINKAGE=X40

LINKAGE=HEX

CONSTRAINED FIT INFORMATION

An overall fit to 8 branching ratios uses 8 measurements and one constraint to determine 6 parameters. The overall fit has a $\chi^2 = 4.5$ for 3 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\langle \delta x_i \delta x_j \rangle / (\delta x_i \cdot \delta x_j)$, in percent, from the fit to the branching fractions, $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$. The fit constrains the x_i whose labels appear in this array to sum to one.

x_5	93				
x_{12}	14	13			
x_{19}	0	0	0		
x_{20}	0	0	0	84	
	x_3	x_5	x_{12}	x_{19}	

Λ_b^0 BRANCHING RATIOS

$$\Gamma(J/\psi(1S)\Lambda \times B(b \rightarrow \Lambda_b^0)) / \Gamma_{\text{total}} \quad \Gamma_1 / \Gamma$$

VALUE (units 10^{-5})	EVTS	DOCUMENT ID	TECN	COMMENT	
5.8 ± 0.8 OUR AVERAGE					
6.01 ± 0.60 ± 0.58 ± 0.28	18	ABAZOV	110 D0	$p\bar{p}$ at 1.96 TeV	NODE=S040215
4.7 ± 2.3 ± 0.2	19	ABE	97B CDF	$p\bar{p}$ at 1.8 TeV	NODE=S040R3

• • • We do not use the following data for averages, fits, limits, etc. • • •

180	± 60	± 90	16	ALBAJAR	91E UA1	$p\bar{p}$ at 630 GeV	
18	ABAZOV	110 uses $B(B^0 \rightarrow J/\psi K_S^0) \times B(b \rightarrow B^0) = (1.74 \pm 0.08) \times 10^{-4}$ to obtain the result. The $(\pm 0.08) \times 10^{-4}$ uncertainty of this product is listed as the last uncertainty of the measurement, $(\pm 0.28) \times 10^{-5}$.	18	ABAZOV	110 D0	$p\bar{p}$ at 1.96 TeV	SYCLP=A
19	ABE	97B	97B CDF	$p\bar{p}$ at 1.8 TeV		SYCLP=A	
19	ABE	97B reports $[B(\Lambda_b^0 \rightarrow J/\psi \Lambda) \times B(b \rightarrow \Lambda_b^0)] / [B(B^0 \rightarrow J/\psi K_S^0) \times B(b \rightarrow B^0)] = 0.27 \pm 0.12 \pm 0.05$. We multiply by our best value $B(B^0 \rightarrow J/\psi K_S^0) \times B(b \rightarrow B^0) = (1.74 \pm 0.08) \times 10^{-4}$. Our first error is their experiment error and our second error is the systematic error from using our best value.					

$$\Gamma(pD^0\pi^-) / \Gamma_{\text{total}} \quad \Gamma_2 / \Gamma$$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
• • • We do not use the following data for averages, fits, limits, etc. • • •					

seen 52 BARI 91 SFM $D^0 \rightarrow K^- \pi^+$
seen BASILE 81 SFM $D^0 \rightarrow K^- \pi^+$

$$\Gamma(\Lambda_c^+\pi^-) / \Gamma_{\text{total}} \quad \Gamma_3 / \Gamma$$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT	
5.7^{+4.0}_{-2.6} OUR FIT Error includes scale factor of 1.6.					

$$8.8 \pm 2.8 \pm 1.5 \quad 20 \text{ ABULENCIA } 07B \text{ CDF } p\bar{p} \text{ at 1.96 TeV}$$

• • • We do not use the following data for averages, fits, limits, etc. • • •

seen	3	ABREU	96N DLPH	$\Lambda_c^+ \rightarrow p K^- \pi^+$	
seen	4	BUSKULIC	96L ALEP	$\Lambda_c^+ \rightarrow p K^- \pi^+, p\bar{K}^0, \Lambda \pi^+ \pi^+ \pi^-$	

20 The result is obtained from $(f_{\text{baryon}}/f_d) (B(\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^-) / B(\bar{B}^0 \rightarrow D^+ \pi^-)) = 0.82 \pm 0.08 \pm 0.11 \pm 0.22$, assuming $f_{\text{baryon}}/f_d = 0.25 \pm 0.04$ and $B(\bar{B}^0 \rightarrow D^+ \pi^-) = (2.68 \pm 0.13) \times 10^{-3}$.

NODE=S040R11

NODE=S040R11

NODE=S040R11

NODE=S040R11

NODE=S040R11;LINKAGE=AB

$\Gamma(\Lambda_c^+ a_1(1260)^-)/\Gamma_{\text{total}}$					Γ_4/Γ	NODE=S040R12 NODE=S040R12
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT		
seen	1	ABREU	96N DLPH	$\Lambda_c^+ \rightarrow p K^- \pi^+, a_1^- \rightarrow \rho^0 \pi^- \rightarrow \pi^+ \pi^- \pi^-$		
$\Gamma(\Lambda_c^+ \pi^+ \pi^- \pi^-)/\Gamma_{\text{total}}$					Γ_5/Γ	
VALUE (units 10^{-3})	EVTS	DOCUMENT ID	TECN	COMMENT		NODE=S040R4 NODE=S040R4
8^{+5}_{-4} OUR FIT	Error includes scale factor of 1.6.					
$17^{+4}_{-8}^{+11}_{-8}$	21 AALTONEN	12A CDF	$p\bar{p}$ at 1.96 TeV			
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$						
seen	90	BARI	91 SFM	$\Lambda_c^+ \rightarrow p K^- \pi^+$		
21 AALTONEN 12A reports $[\Gamma(\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^+ \pi^- \pi^-)/\Gamma_{\text{total}}] / [B(\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^-)] = 3.04 \pm 0.33^{+0.70}_{-0.55}$ which we multiply by our best value $B(\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^-) = (5.7^{+4.0}_{-2.6}) \times 10^{-3}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.						
$\Gamma(\Lambda_c^+ \pi^+ \pi^- \pi^-)/\Gamma(\Lambda_c^+ \pi^-)$					Γ_5/Γ_3	
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT		NODE=S040R05 NODE=S040R05
1.46 ± 0.22 OUR FIT	Error includes scale factor of 1.1.					
$1.43 \pm 0.16 \pm 0.13$	AAIJ	11E LHCb	$p\bar{p}$ at 7 TeV			
$\Gamma(\Lambda_c(2595)^+ \pi^-, \Lambda_c(2595)^+ \rightarrow \Lambda_c^+ \pi^+ \pi^-)/\Gamma(\Lambda_c^+ \pi^+ \pi^- \pi^-)$					Γ_6/Γ_5	
VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT		NODE=S040R06 NODE=S040R06
$4.4 \pm 1.7^{+0.6}_{-0.4}$	AAIJ	11E LHCb	$p\bar{p}$ at 7 TeV			
$\Gamma(\Lambda_c(2625)^+ \pi^-, \Lambda_c(2625)^+ \rightarrow \Lambda_c^+ \pi^+ \pi^-)/\Gamma(\Lambda_c^+ \pi^+ \pi^- \pi^-)$					Γ_7/Γ_5	
VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT		NODE=S040R07 NODE=S040R07
$4.3 \pm 1.5 \pm 0.4$	AAIJ	11E LHCb	$p\bar{p}$ at 7 TeV			
$\Gamma(\Sigma_c(2455)^0 \pi^+ \pi^-, \Sigma_c^0 \rightarrow \Lambda_c^+ \pi^-)/\Gamma(\Lambda_c^+ \pi^+ \pi^- \pi^-)$					Γ_8/Γ_5	
VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT		NODE=S040R08 NODE=S040R08
$7.4 \pm 2.4 \pm 1.2$	AAIJ	11E LHCb	$p\bar{p}$ at 7 TeV			
$\Gamma(\Sigma_c(2455)^{++} \pi^- \pi^-, \Sigma_c^{++} \rightarrow \Lambda_c^+ \pi^+)/\Gamma(\Lambda_c^+ \pi^+ \pi^- \pi^-)$					Γ_9/Γ_5	
VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT		NODE=S040R09 NODE=S040R09
$4.2 \pm 1.8 \pm 0.7$	AAIJ	11E LHCb	$p\bar{p}$ at 7 TeV			
$\Gamma(\Lambda K^0 2\pi^+ 2\pi^-)/\Gamma_{\text{total}}$					Γ_{10}/Γ	
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT		NODE=S040R2 NODE=S040R2
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$						
seen	4	22 ARENTON	86 FMPS	$\Lambda K_S^0 2\pi^+ 2\pi^-$		
22 See the footnote to the ARENTON 86 mass value.						
$\Gamma(\Lambda_c^+ \ell^- \bar{\nu}_\ell \text{anything})/\Gamma_{\text{total}}$					Γ_{11}/Γ	
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT		NODE=S040R6 NODE=S040R6
0.098 ± 0.022 OUR AVERAGE	[0.098 ± 0.023 OUR 2012 AVERAGE]					
0.092 $\pm 0.017 \pm 0.015$	23 BARATE	98D ALEP	$e^+ e^- \rightarrow Z$			
0.13 $\pm 0.04 \pm 0.02$	29 ABREU	95S DLPH	$e^+ e^- \rightarrow Z$			
$\bullet \bullet \bullet$ We do not use the following data for averages, fits, limits, etc. $\bullet \bullet \bullet$						
0.081 $\pm 0.020 \pm 0.013$	55 BUSKULIC	95L ALEP	Repl. by BARATE 98D			
0.16 $\pm 0.06 \pm 0.03$	21 BUSKULIC	92E ALEP	$\Lambda_c^+ \rightarrow p K^- \pi^+$			

23 BARATE 98D reports $[\Gamma(\Lambda_b^0 \rightarrow \Lambda_c^+ \ell^- \bar{\nu}_\ell \text{anything})/\Gamma_{\text{total}}] \times [B(\bar{b} \rightarrow b\text{-baryon})] = 0.0086 \pm 0.0007 \pm 0.0014$ which we divide by our best value $B(\bar{b} \rightarrow b\text{-baryon}) = (9.3 \pm 1.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Measured using $\Lambda_c \ell^-$ and $\Lambda \ell^+ \ell^-$.

24 ABREU 95S reports $[\Gamma(\Lambda_b^0 \rightarrow \Lambda_c^+ \ell^- \bar{\nu}_\ell \text{anything})/\Gamma_{\text{total}}] \times [B(\bar{b} \rightarrow b\text{-baryon})] = 0.0118 \pm 0.0026^{+0.0031}_{-0.0021}$ which we divide by our best value $B(\bar{b} \rightarrow b\text{-baryon}) = (9.3 \pm 1.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

25 BUSKULIC 95L reports $[\Gamma(\Lambda_b^0 \rightarrow \Lambda_c^+ \ell^- \bar{\nu}_\ell \text{anything})/\Gamma_{\text{total}}] \times [B(\bar{b} \rightarrow b\text{-baryon})] = 0.00755 \pm 0.0014 \pm 0.0012$ which we divide by our best value $B(\bar{b} \rightarrow b\text{-baryon}) = (9.3 \pm 1.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value.

26 BUSKULIC 92E reports $[\Gamma(\Lambda_b^0 \rightarrow \Lambda_c^+ \ell^- \bar{\nu}_\ell \text{anything})/\Gamma_{\text{total}}] \times [B(\bar{b} \rightarrow b\text{-baryon})] = 0.015 \pm 0.0035 \pm 0.0045$ which we divide by our best value $B(\bar{b} \rightarrow b\text{-baryon}) = (9.3 \pm 1.5) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best value. Superseded by BUSKULIC 95L.

$\Gamma(\Lambda_c^+ \ell^- \bar{\nu}_\ell)/\Gamma_{\text{total}}$	Γ_{12}/Γ		
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.065^{+0.032}_{-0.025} OUR FIT	Error includes scale factor of 1.8.		

0.050^{+0.011}_{-0.008}^{+0.016}_{-0.012}	27 ABDALLAH 04A DLPH $e^+ e^- \rightarrow Z^0$
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27 Derived from a combined likelihood and event rate fit to the distribution of the Isgur-Wise variable and using HQET. The slope of the form factor is measured to be $\rho^2 = 2.03 \pm 0.46^{+0.72}_{-1.00}$.

$\Gamma(\Lambda_c^+ \ell^- \bar{\nu}_\ell)/\Gamma(\Lambda_c^+ \pi^-)$	Γ_{12}/Γ_3		
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
11⁺⁴₋₅ OUR FIT	Error includes scale factor of 1.2.		
16.6^{+3.0}_{-3.6}^{+2.8}	AALTONEN 09E CDF $p\bar{p}$ at 1.96 TeV		

$\Gamma(\Lambda_c^+ \pi^+ \pi^- \ell^- \bar{\nu}_\ell)/\Gamma_{\text{total}}$	Γ_{13}/Γ		
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.056^{+0.031}_{-0.030}	28 ABDALLAH 04A DLPH $e^+ e^- \rightarrow Z^0$		

28 Derived from the fraction of $\Gamma(\Lambda_b^0 \rightarrow \Lambda_c^+ \ell^- \bar{\nu}_\ell) / (\Gamma(\Lambda_b^0 \rightarrow \Lambda_c^+ \ell^- \bar{\nu}_\ell) + \Gamma(\Lambda_b^0 \rightarrow \Lambda_c^+ \pi^+ \pi^- \ell^- \bar{\nu}_\ell)) = 0.47^{+0.10+0.07}_{-0.08-0.06}$.

$\Gamma(\Lambda_c^+ \ell^- \bar{\nu}_\ell)/[\Gamma(\Lambda_c^+ \ell^- \bar{\nu}_\ell) + \Gamma(\Lambda_c^+ \pi^+ \pi^- \ell^- \bar{\nu}_\ell)]$	$\Gamma_{12}/(\Gamma_{12}+\Gamma_{13})$		
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.47^{+0.10}_{-0.08}^{+0.07}_{-0.06}	ABDALLAH 04A DLPH $e^+ e^- \rightarrow Z^0$		

$\Gamma(\Lambda_c(2595)^+ \ell^- \bar{\nu}_\ell)/\Gamma(\Lambda_c^+ \ell^- \bar{\nu}_\ell)$	Γ_{14}/Γ_{12}		
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.126^{+0.033}_{-0.038}^{+0.047}	AALTONEN 09E CDF $p\bar{p}$ at 1.96 TeV		

$\Gamma(\Lambda_c(2625)^+ \ell^- \bar{\nu}_\ell)/\Gamma(\Lambda_c^+ \ell^- \bar{\nu}_\ell)$	Γ_{15}/Γ_{12}		
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.210^{+0.042}_{-0.050}^{+0.071}	AALTONEN 09E CDF $p\bar{p}$ at 1.96 TeV		

$[\frac{1}{2}\Gamma(\Sigma_c(2455)^0 \pi^+ \ell^- \bar{\nu}_\ell) + \frac{1}{2}\Gamma(\Sigma_c(2455)^{++} \pi^- \ell^- \bar{\nu}_\ell)]/\Gamma(\Lambda_c^+ \ell^- \bar{\nu}_\ell)$	$(\frac{1}{2}\Gamma_{16} + \frac{1}{2}\Gamma_{17})/\Gamma_{12}$		
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.054^{+0.022}_{-0.018}^{+0.021}	AALTONEN 09E CDF $p\bar{p}$ at 1.96 TeV		

$\Gamma(ph^-)/\Gamma_{\text{total}}$	Γ_{18}/Γ			
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<2.3 $\times 10^{-5}$	90	29 ACOSTA 050 CDF	$p\bar{p}$ at 1.96 TeV	

29 Assumes $f_{\Lambda_b} / f_d = 0.25$, and equal momentum distribution for Λ_b and B mesons.

NODE=S040R6;LINKAGE=KK

NODE=S040R6;LINKAGE=CA

NODE=S040R6;LINKAGE=BL

NODE=S040R6;LINKAGE=BA

NODE=S040R15
NODE=S040R15

NODE=S040R15;LINKAGE=AB

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NODE=S040R02NODE=S040R03
NODE=S040R03NODE=S040R18
NODE=S040R18

NODE=S040R18;LINKAGE=AC

$\Gamma(p\pi^-)/\Gamma_{\text{total}}$					Γ_{19}/Γ
<u>VALUE (units 10^{-6})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
4.0±0.8 OUR FIT					
3.6±1.0 OUR AVERAGE $[(3.5 \pm 1.0) \times 10^{-6} \text{ OUR 2012 AVERAGE}]$					
3.6±0.8±0.6 $^{30}_{30}$ AALTONEN 09C CDF $p\bar{p}$ at 1.96 TeV					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<50	90	³¹ BUSKULIC 96V ALEP	e ⁺ e ⁻ → Z		
$^{30}_{30}$ AALTONEN 09C reports $[\Gamma(\Lambda_b^0 \rightarrow p\pi^-)/\Gamma_{\text{total}}] / [B(B^0 \rightarrow K^+\pi^-)] \times [B(\bar{b} \rightarrow b\text{-baryon})] / [B(\bar{b} \rightarrow B^0)] = 0.042 \pm 0.007 \pm 0.006$ which we multiply or divide by our best values $B(B^0 \rightarrow K^+\pi^-) = (1.96 \pm 0.05) \times 10^{-5}$, $B(\bar{b} \rightarrow b\text{-baryon}) = (9.3 \pm 1.5) \times 10^{-2}$, $B(\bar{b} \rightarrow B^0) = (40.2 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.					
³¹ BUSKULIC 96V assumes PDG 96 production fractions for B^0 , B^+ , B_s , b baryons.					
$\Gamma(pK^-)/\Gamma_{\text{total}}$					Γ_{20}/Γ
<u>VALUE (units 10^{-6})</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
4.8±0.9 OUR FIT					
5.6±1.4 OUR AVERAGE $[(5.5 \pm 1.4) \times 10^{-6} \text{ OUR 2012 AVERAGE}]$					
5.6±1.0±0.9 $^{32}_{32}$ AALTONEN 09C CDF $p\bar{p}$ at 1.96 TeV					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<360	90	³³ ADAM 96D DLPH	e ⁺ e ⁻ → Z		
< 50	90	³⁴ BUSKULIC 96V ALEP	e ⁺ e ⁻ → Z		
$^{32}_{32}$ AALTONEN 09C reports $[\Gamma(\Lambda_b^0 \rightarrow pK^-)/\Gamma_{\text{total}}] / [B(B^0 \rightarrow K^+\pi^-)] \times [B(\bar{b} \rightarrow b\text{-baryon})] / [B(\bar{b} \rightarrow B^0)] = 0.066 \pm 0.009 \pm 0.008$ which we multiply or divide by our best values $B(B^0 \rightarrow K^+\pi^-) = (1.96 \pm 0.05) \times 10^{-5}$, $B(\bar{b} \rightarrow b\text{-baryon}) = (9.3 \pm 1.5) \times 10^{-2}$, $B(\bar{b} \rightarrow B^0) = (40.2 \pm 0.7) \times 10^{-2}$. Our first error is their experiment's error and our second error is the systematic error from using our best values.					
³³ ADAM 96D assumes $f_{B^0} = f_{B^-} = 0.39$ and $f_{B_s} = 0.12$.					
³⁴ BUSKULIC 96V assumes PDG 96 production fractions for B^0 , B^+ , B_s , b baryons.					
$\Gamma(p\pi^-)/\Gamma(pK^-)$					Γ_{19}/Γ_{20}
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
0.84±0.09 OUR FIT					
0.86±0.08±0.05	AAIJ	12AR LHCb	$p\bar{p}$ at 7 TeV		
$\Gamma(\Lambda\mu^+\mu^-)/\Gamma_{\text{total}}$					Γ_{21}/Γ
<u>VALUE (units 10^{-7})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
17.3±4.2±5.5	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV		
$\Gamma(\Lambda\gamma)/\Gamma_{\text{total}}$					Γ_{22}/Γ
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
<1.3 × 10⁻³	90	ACOSTA 02G CDF	$p\bar{p}$ at 1.8 TeV		
PARTIAL BRANCHING FRACTIONS IN $\Lambda_b \rightarrow \Lambda\mu^+\mu^-$					
$B(\Lambda_b \rightarrow \Lambda\mu^+\mu^-) (\mathbf{q^2 < 2.0 \, GeV^2/c^2})$					
<u>VALUE (units 10^{-7})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
0.15±2.01±0.05	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV		
$B(\Lambda_b \rightarrow \Lambda\mu^+\mu^-) (2.0 < q^2 < 4.3 \, GeV^2/c^2)$					
<u>VALUE (units 10^{-7})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1.8±1.7±0.6	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV		
$B(\Lambda_b \rightarrow \Lambda\mu^+\mu^-) (4.3 < q^2 < 8.68 \, GeV^2/c^2)$					
<u>VALUE (units 10^{-7})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
-0.2±1.6±0.1	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV		
$B(\Lambda_b \rightarrow \Lambda\mu^+\mu^-) (10.09 < q^2 < 12.86 \, GeV^2/c^2)$					
<u>VALUE (units 10^{-7})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
3.0±1.5±1.0	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV		
$B(\Lambda_b \rightarrow \Lambda\mu^+\mu^-) (14.18 < q^2 < 16.0 \, GeV^2/c^2)$					
<u>VALUE (units 10^{-7})</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1.0±0.7±0.3	AALTONEN	11AI CDF	$p\bar{p}$ at 1.96 TeV		

$B(\Lambda_b \rightarrow \Lambda\mu^+\mu^-)$ (16.0 < q^2 GeV $^2/c^2$)

VALUE (units 10 $^{-7}$)	DOCUMENT ID	TECN	COMMENT
7.0±1.9±2.2	AALTONEN	11AI	CDF $p\bar{p}$ at 1.96 TeV

NODE=S040PB6
NODE=S040PB6 **$B(\Lambda_b \rightarrow \Lambda\mu^+\mu^-)$ (1.0 < q^2 < 6.0 GeV $^2/c^2$)**

VALUE (units 10 $^{-7}$)	DOCUMENT ID	TECN	COMMENT
1.3±2.1±0.4	AALTONEN	11AI	CDF $p\bar{p}$ at 1.96 TeV

NODE=S040PB7
NODE=S040PB7 **$B(\Lambda_b \rightarrow \Lambda\mu^+\mu^-)$ (0.0 < q^2 < 4.3 GeV $^2/c^2$)**

VALUE (units 10 $^{-7}$)	DOCUMENT ID	TECN	COMMENT
2.7±2.5±0.9	AALTONEN	11AI	CDF $p\bar{p}$ at 1.96 TeV

NODE=S040PB8
NODE=S040PB8**CP VIOLATION** A_{CP} is defined as

$$A_{CP} = \frac{B(\Lambda_b^0 \rightarrow f) - B(\bar{\Lambda}_b^0 \rightarrow \bar{f})}{B(\Lambda_b^0 \rightarrow f) + B(\bar{\Lambda}_b^0 \rightarrow \bar{f})},$$

the CP-violation asymmetry of exclusive Λ_b^0 and $\bar{\Lambda}_b^0$ decay. **$A_{CP}(\Lambda_b \rightarrow p\pi^-)$**

VALUE	DOCUMENT ID	TECN	COMMENT
0.03±0.17±0.05	AALTONEN	11N	CDF $p\bar{p}$ at 1.96 TeV

NODE=S040CP1
NODE=S040CP1 **$A_{CP}(\Lambda_b \rightarrow pK^-)$**

VALUE	DOCUMENT ID	TECN	COMMENT
0.37±0.17±0.03	AALTONEN	11N	CDF $p\bar{p}$ at 1.96 TeV

NODE=S040CP2
NODE=S040CP2 **Λ_b^0 REFERENCES**

AAD	13U	PR D87 032002	G. Aad <i>et al.</i>	(ATLAS Collab.)
AAIJ	12AR	JHEP 1210 037	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	12E	PL B708 241	R. Aaij <i>et al.</i>	(LHCb Collab.)
AALTONEN	12A	PR D85 032003	T. Aaltonen <i>et al.</i>	(CDF Collab.)
ABAZOV	12U	PR D85 112003	V.M. Abazov <i>et al.</i>	(D0 Collab.)
AAIJ	11E	PR D84 092001	R. Aaij <i>et al.</i>	(LHCb Collab.)
Also		PR D85 039904 (<i>errat</i>)	R. Aaij <i>et al.</i>	(LHCb Collab.)
AALTONEN	11	PRL 106 121804	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AALTONEN	11AI	PRL 107 201802	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AALTONEN	11N	PRL 106 181802	T. Aaltonen <i>et al.</i>	(CDF Collab.)
ABAZOV	11O	PR D84 031102	V.M. Abazov <i>et al.</i>	(D0 Collab.)
AALTONEN	10B	PRL 104 102002	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AALTONEN	09C	PRL 103 031801	T. Aaltonen <i>et al.</i>	(CDF Collab.)
AALTONEN	09E	PR D79 032001	T. Aaltonen <i>et al.</i>	(CDF Collab.)
ABAZOV	07S	PRL 99 142001	V.M. Abazov <i>et al.</i>	(D0 Collab.)
ABAZOV	07U	PRL 99 182001	V.M. Abazov <i>et al.</i>	(D0 Collab.)
ABULENCIA	07A	PR D98 122001	A. Abulencia <i>et al.</i>	(FNAL CDF Collab.)
ABULENCIA	07B	PRL 98 122002	A. Abulencia <i>et al.</i>	(FNAL CDF Collab.)
ACOSTA	06	PRL 96 202001	D. Acosta <i>et al.</i>	(CDF Collab.)
ABAZOV	05C	PRL 94 102001	V.M. Abazov <i>et al.</i>	(D0 Collab.)
ACOSTA	05O	PR D72 051104	D. Acosta <i>et al.</i>	(CDF Collab.)
ABDALLAH	04A	PL B585 63	J. Abdallah <i>et al.</i>	(DELPHI Collab.)
ACOSTA	02G	PR D66 112002	D. Acosta <i>et al.</i>	(CDF Collab.)
ABREU	99W	EPJ C10 185	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ACKERSTAFF	98G	PL B426 161	K. Ackerstaff <i>et al.</i>	(OPAL Collab.)
BARATE	98D	EPJ C2 197	R. Barate <i>et al.</i>	(ALEPH Collab.)
ABE	97B	PR D55 1142	F. Abe <i>et al.</i>	(CDF Collab.)
ABE	96M	PRL 77 1439	F. Abe <i>et al.</i>	(CDF Collab.)
ABREU	96D	ZPHY C71 199	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ABREU	96N	PL B374 351	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ADAM	96D	ZPHY C72 207	W. Adam <i>et al.</i>	(DELPHI Collab.)
BUSKULIC	96L	PL B380 442	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
BUSKULIC	96V	PL B384 471	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
PDG	96	PR D54 1	R. M. Barnett <i>et al.</i>	(UA1 Collab.)
ABREU	95S	ZPHY C68 375	P. Abreu <i>et al.</i>	(DELPHI Collab.)
AKERS	95K	PL B353 402	R. Akers <i>et al.</i>	(OPAL Collab.)
BUSKULIC	95L	PL B357 685	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
ABE	93B	PR D47 R2639	F. Abe <i>et al.</i>	(CDF Collab.)
BUSKULIC	92E	PL B294 145	D. Buskulic <i>et al.</i>	(ALEPH Collab.)
ALBAJAR	91E	PL B273 540	C. Albajar <i>et al.</i>	(UA1 Collab.)
BARI	91	NC 104A 1787	G. Bari <i>et al.</i>	(CERN R422 Collab.)
ARENTON	86	NP B274 707	M.W. Arenton <i>et al.</i>	(ARIZ, NDAM, VAND)
BASILE	81	LNC 31 97	M. Basile <i>et al.</i>	(CERN R415 Collab.)

NODE=S040

REFID=54939
 REFID=54595
 REFID=54043
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